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ROE'S CLASSIFICATION OF OCCUPATIONS IN PREDICTING ACADEMIC ACHIEVEMENT.

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THIS REPORT SUMMARIZES SEVERAL STUDIES BY THE AUTHORS EMPLOYING A TWO-WAY CLASSIFICATION OF OCCUPATIONS DESCRIBED BY ROE IN 1956. USING A CODING-BY-EXAMPLE CLASSIFICATION, CLERKS ACHIEVED INTERRATER RELIABILITY OF .98 FOR GROUPS AND .92 FOR LEVELS. THESE OCCUPATIONAL CODINGS TYPICALLY CORRELATED MINIMALLY BUT UNIQUELY WITH ACADEMIC CRITERIA, CONTRIBUTING SIGNIFICANTLY TO MULTIPLE PREDICTION OF SUCH DISPARATE CRITERIA AS ARCHITECTURE SCHOOL SUCCESS, GRADUATION FROM LAW SCHOOL, AND GRADES IN FRESHMAN COURSE WORK. FURTHER, STUDENT RATINGS OF FATHER'S AND INTENDED OCCUPATIONAL GROUPS WERE FOUND TO BE SIGNIFICANTLY RELATED TO ACADEMIC PERFORMANCE. (AUTHOR)

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# Roe's Classification of Occupations in Predicting Academic Achievement

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This report summarizes several studies by the authors employing a two-way classification of occupations described by Roe in 1956. Using a coding-by-example classification, clerks achieved inter-rater reliability of .98 for groups and .92 for levels. These occupational codings typically correlated minimally but uniquely with academic criteria, contributing significantly to multiple prediction of such disparate criteria as architecture school success, graduation from law school, and grades in freshman course work. Further, student ratings of father's and intended occupational groups were found to be significantly related to academic performance.

Among demographic variables studied in relation to academic performance, socioeconomic status (SES) leads in sheer quantity of research and is regarded as a "basic" correlate of such performance together with ability and sex (Lavin, 1965). Typically, researchers measure SES through parental education and/or father's occupation coded according to the census bureau classification or the social class placement schema of Warner et al. (1949). Although these traditional measures of SES contribute to academic prediction, they lack implications for psychological theory of occupational choice and for vocational guidance in college.

In 1956 Roe presented an alternative occupational classification designed to be of greater value psychologically. While it was still correlated with education and training, this classification also had to do with level of job responsibility and particularly with interests. Subsequent studies using Roe's classification (Brunkan, 1965; Hagen, 1960; Switzer, D. K., et al., 1962)

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have focused not upon academic prediction but rather upon her theory (1957) that parental attitudes are reflected in children's vocational choices. These investigations have consistently produced negative results. The present report summarizes several predictive studies over the past year which tested the utility of this two-way classification quite differently than these other investigators have done and with quite different results.

In Roe's scheme (this and subsequent references to Roe are to the 1956 volume) every occupation is classified two ways, both by groups and by levels. Group subdivisions numbering eight indicate the primary focus of activity in the occupation. Classification into levels depends upon the degree of personal autonomy and the level of skill and training required. There are six levels. This results in an 8 by 6-celled table, arranged so that levels are in hierarchical order, with level 1 at the top and each successive level requiring less training and less responsibility.

The specific groups are: service, business contact, organization, technology, outdoor, science, general cultural, arts and entertainment. Classification by primary focus is clearly related to classifications of interests. Within these interest groups, classification by level of function is based primarily on level of responsibility. Although there are 48 cells within this scheme, there are some cells for which there are no appropriate occupations and others for which there are a very large number. An example of the former is level 6 for group 7, general cultural; an example of the latter is level 3 of group 3, organization.

Roe's classification was first adapted to the type of research being conducted and to the limitations of the data. The research was concerned with relationships to academic achievement of biographic information taken from

student applications to the University of Washington (UW). Application forms typically devote space to father's and mother's occupations, and inquire of the applicant's vocational plans. The application blanks were read by clerks who coded the biographic items being studied. The occupational information provided was extremely brief, usually one word, "doctor," "salesman," "teacher," as dictated by the small space provided.

To minimize training time for clerks and reduce subjective judgments, Roe's occupational schema was altered in the direction of a coding-by-example classification (Appendix 1). One alteration was arbitrarily limiting a given occupational title to one cell, whereas Roe sometimes placed a title in more than one group (e.g., draftsman under both organization and technology) or in more than one level (e.g., performers in the arts "at highest levels" in level 1 and performers "average" in level 2). A critical instance of limitation was the assignment of all sales jobs to business contact except retail clerks who remained in level 4 organization. Entries requiring value judgments were eliminated, e.g., "executives, average," "inventive geniuses," and "small factory managers." The table of classifications also reflects the locale in which it was developed--there are no Federal Cabinet officers or Supreme Court justices in Washington State, but there are orchardists and charter boat skippers.

The brevity of job titles supplied in this manner is unavoidably a source of unreliability. For example, "fireman" with no further specification is coded service even though a small percentage of these persons may be railroad firemen (technology). An engineer is level two even though many "engineers" have been noted with only high school education. The social desirability of this particular title has caused certain individuals and industries to apply it too liberally.

Nine additional codings were used by clerks: housewife or homemaker; undecided; unscorable; retired, unspecified, including retired armed forces unspecified; deceased; armed forces unspecified; business firm or government work unspecified; unknown; none or no entry.

The distributions of paternal occupations in five different samples of students in Washington appear in Table 1. As Roe indicated, organization and technology were both very large. Disproportionately large numbers of fathers in organization and general cultural were found for first year law students as were greater numbers in outdoor and technology found for high school students. The lowest level of paternal work was found in the unselected high school group and in those college students receiving scholarship aid.

## Reliability

Inter-rater reliability was investigated using a sample of 83 admissions forms each of which contained three occupational listings. Each form was coded independently by four well-practiced clerks. Only 187 of the 249 occupations listed were used to calculate reliability. The "housewife" and "none" categories were excluded as they would necessarily inflate any estimate of reliability. Nonetheless, the reliability of the system appears unquestionable: .98 for groups, and .92 for levels after correction for number of contributing raters using Horst's generalized formula for reliability (1949). This degree of reliability, however, is exactly what is demanded of any occupational classification incorporated in this kind of research. In all of the following validity analyses, only one clerk's ratings of occupations were used with a random check by another clerk as to accuracy. The costliness of the coding procedure precluded using average ratings of two or more clerks.

Table 1

Father's Occupation Using Roe's Classification in Five Student Samples

| Father's occupation group | Percent of student sample | | | | |
|---|---|---|---|---|---|
| | UW law | UW architecture | UW freshmen | High school seniors | UW graduating scholarship holders |
| Service | 04 | 04 | 06 | 06 | 04 |
| Business Contact | 10 | 12 | 10 | 08 | 11 |
| Organization | 35 | 26 | 22 | 15 | 26 |
| Technology | 23 | 40 | 37 | 48 | 42 |
| Outdoor | 06 | 03 | 05 | 15 | 06 |
| Science | 05 | 04 | 07 | 04 | 03 |
| General Cultural | 16 | 04 | 09 | 04 | 07 |
| Arts & Entertainment | 01 | 07 | 04 | 00 | 01 |
| Level (mean) | 2.8 | 3.1 | 2.8 | 3.9 | 3.4 |
| N | 900 | 158 | 228 | 645 | 923 |

## Predictive validity

The first study in which occupational codings were used involved multiple intellective and nonintellective predictors and law school criteria for a sample of 980 UW law students. The actual correlations of occupational level and groups with the criteria fluctuated about zero with a range of r's from -.08 to .09 for four selected criteria (Lunneborg & Lunneborg, 1966b). Nonetheless, these occupational variables increased prediction of success in law school in subsequent multiple regression analyses. For multiple prediction, of course, not only predictor-criterion correlations are critical but predictor intercorrelations as well. The selection of a best set of predictors from a pool used the iterative selection technique of Horst (1950), picking the best single predictor and then adding to it from the pool that predictor which best complements the first, then from those remaining the one which adds most to the predictive efficiency of the first two, etc. More unique predictors, therefore, can contribute to multiple prediction despite the fact that they may have little individual validity.

Best sets of eight predictors from a pool of 51 were selected for each of sixteen law school criteria and in twelve of these best sets, one or two occupational groups appeared. Father's occupation in organization, i.e., in managerial or white collar jobs in business, industry, or government, was a positive asset in the multiple prediction of law school success. It was selected on six occasions and comparatively early, either third, fourth or fifth.

Father's occupation was also used as a predictor in a study of success in the first and second years of architecture school (Lunneborg & Lunneborg, 1966a). As in the law study, individual correlations between the occupational

variables and the criteria were low. The most promising were three groups: business contact, which correlated -.13 with first year architecture grades and -.23 with second year grades, technology, correlating -.11 and .19 respectively, and science, which correlated with faculty rating .32. Because of the limited sample size (N = 158) only these three occupational variables were used in an iterative predictor selection upon a predictor pool containing nine other nonintellective measures plus seven scores from the Architecture School Aptitude Test (ASAT). For each of the four criteria studied, at least one occupational group was selected in the best set. These groups helped to augment multiple prediction from ASAT scores alone from .34 to .40 for first year grades, from .43 to .60 for second year grades, from .36 to .46 for overall GPA, and from .52 to .77 for faculty rating. On this occasion, business contact, i.e., face-to-face personal persuasion and selling, was the best occupational predictor. Sons of fathers so employed were <u>less</u> likely to succeed in architecture as were sons of fathers technologically employed. In this study and the one following, no limit was set on the number of variables to be included in the best set.

In a study to improve differential prediction of freshman grades through nonintellective variables (Lunneborg & Lunneborg, 1966c), the number of occupational variables entered into sequential predictor selection was again limited because the sample numbered only 520. Two groups, organization and technology, with the highest frequency of fathers were included, as well as father's occupational level. Also included were two groups (technological and general cultural) receiving the largest number of nominations as the <u>intended vocation</u> of these freshman students, as well as their intended level of occupation. All six of these occupational variables significantly improved

prediction, although their range of correlations with the criteria was only -.30 to .18. Further, when the nineteen best predictors were examined for their contribution to differential prediction, intent to enter a technical vocation and level of intended vocation were the second and fourth predictors selected. Although an English usage test was the first differential predictor selected, a second intellective predictor was not chosen until the eighth iteration. The criteria were first quarter grades in English composition, mathematics, foreign language, and physical science.

## Concurrent validity

In the study of law school performance, relations between father's occupational level and groups and other social class predictors supported the validity of Roe's schema. Remembering that low scores on level represent the most prestigious and responsible jobs, father's occupational level correlated with father's education -.54, with mother's education -.38, with father-an-attorney -.32, and with having an attorney relative -.29. Father's education was uncorrelated with five of the occupational groups but was negatively related (-.25) with technology and positively related to science (.20) and general cultural (.38) in keeping with the disproportionate numbers of jobs at the higher levels for these groups. For the same reason, occupational level correlated only with technology .45, science -.37, and general cultural -.42. Father's occupation was in no way related to student's choice of major field of undergraduate study, but this is not surprising as these students were homogeneous with respect to vocational choice.

Among architecture students, father's occupational level correlated with father's education -.42, with mother's education -.29, and with father-in-arts & entertainment -.26. Also similar to the findings among law students,

education of architecture students' fathers was uncorrelated with their occupational groups except for -.32 with technology, and .28 with both the science and general cultural groups. Level was correlated with groups in the same pattern as among law students except, in addition, fathers in arts & entertainment tended to have high level positions (-.26).

This same pattern of correlations was present among the general university freshman sample as well. Father's occupational level correlated with his education -.52, and with mother's education -.25. Father's education correlated only with the occupational groups of technology -.16, science .20, and general cultural .31. Father's level correlated with his groups .19 for technology, -.34 for science, and -.25 for general cultural. These relationships between education and occupational level are consistent with Roe's intent that levels partly represent training and education required for different occupations.

Additional evidence of the relationship of groups and levels to socio-economic status may be found in a study by Beanblossom (1967) of 874 UW graduating scholarship holders. The families of these students were classified as high, medium, or low SES on the basis of father's education, income, and occupation, white or blue collar. Chi-square tests of the distribution of these three levels of SES for each Roe group were all highly significant except for arts & entertainment for which expected cell frequencies were too small. Those groups significantly overrepresented in the high SES category and underrepresented in the low were sales, organization, science, and general cultural. Low socio-economic groups were service, technology, and outdoor. The 3 x 3 chi-square value for Roe's levels 1-2, 3-4, and 5-6 against SES was 315, extremely significant. Gamma, a measure

of association for cross classifications, provides a better idea of these relationships of Roe's variables to SES: .75 with levels, -.52 with service, .40 with sales, .48 with organization, -.52 with technology, -.57 with outdoor, .75 with science, .66 with general cultural, and -.06 with arts & entertainment.

Student ratings of Roe's groups

When it was established that Roe's system had validity in predicting academic criteria when classifications were made by trained clerks, the utility of student self-ratings of occupational groups was assessed. The following items were included in a "Survey of Educational Plans after High School" administered with the Washington Pre-College test battery autumn 1966 to (approximately one-third of) the high school seniors tested in the state:

1. What is the primary focus of your father's occupation? (Select only <u>one</u>.)

   (0) service: attending to the needs and welfare of others through guidance, domestic, personal or protective services

   (1) business contact: face-to-face personal persuasion to sell commodities, services, investments

   (2) organization: managerial, ownership, or white collar job in business, industry, or government

   (3) technology: concerned with production, maintenance, and transportation of commodities and utilities; includes engineering, communication, crafts, machine trades

   (4) outdoor: agriculture, fishery, forestry, mining, and kindred occupations

(5) sciences: research in all fields, mathematicians, doctors, college teachers in science, nurses, dentists, veterinarians, weather observers, etc.

(6) general cultural: occupation in education, journalism, law, ministry, linguistics; includes all elementary and high school teachers

(7) arts and entertainment: uses special skills in creative arts, entertainment, or sports

2. From the above seven categories, which is the primary focus of your choice of vocation? (Again, pick only one response. Use 8 if undecided.)

High school transcripts were then drawn for approximately 2,000 of these students on the basis of the inclusion of transcripts of father's occupation. Transcript occupations were clerk-coded for group and level. Student ratings of father's and intended occupational groups were then compared with clerk codings, grades, test scores and other survey items such as parental education. The transcript designations of paternal occupation had other sources of unreliability than brevity--date of entry, source of information, recorder of information, guardian occupation listed as father's to mention a few. Two-thirds of these designations proved incomplete or ambiguous, e.g., simply a company name, and could not be coded. In contrast, only 8.5% of students indicated the focus of their intended occupation was undecided. In comparing survey items N's vary regularly because of missing data. Results described as significant are so at least at the .05 level.

Student ratings and clerk codings. There were 628 students with adequate clerk codings of father's occupation, and the phi coefficients between these

and their own ratings of father's group ranged from .31 for service to .75 for science and .86 for general cultural occupations. Clerks classified many more occupations as technological than did the students who saw their fathers' jobs as having more to do with service or organization. Phi coefficients below .50, despite statistical significance, cast doubt upon the reliability of student ratings in prediction. Assuming, however, the basic attenuator of these relationships was the unreliability of the clerks' information (some transcripts dated from first grade), it is worth examining some other correlates of the students' ratings.

Father's occupation and parental education. Student ratings of father's occupational groups and both father's and mother's education (N's = 1950) were tested by one-way analyses of variance. Highly significant F's followed by Duncan's multiple range test established that fathers in general cultural and scientific occupations had a significantly higher level of education than men in all other occupations. The same finding held for mother's education. The lowest educational level, high school graduation, was found for outdoor, service, and technological groups in both fathers and mothers. Arts & entertainment, business contact, and organization were intermediate groups, with organizational fathers and their wives significantly more educated than these lowest three groups. These results are consistent with those already discussed between clerk-coded groups and parents' education.

Father's occupation and mother's employment. Response to the item, "Does your mother now have a job outside the home?" was "yes" in 44% of 1968 cases. A chi-square test of differences among the eight groups was significant and indicated working mothers' husbands were overrepresented in service and underrepresented in science.

Father's occupation and education and student's intended occupation. Chi-square tests of the frequencies with which sons selected father's group as their intended group were significant with one exception, agreeing with previous research that sons tend to follow their fathers' general type of occupation (Jenson & Kirchner, 1955). (Frequencies of fathers in the arts for both males and females were too small to adequately test this hypothesis.) While sons tended to follow their fathers, daughters tended not to. Only daughters of men in organization significantly more often intended to work in father's group. These college-minded females undoubtedly had teaching predominantly in mind, as may be seen from Table 2, which presents for each paternal occupational group the highest percentage of offspring preferring any group. Thus, for example, 38% of the 95 females whose fathers were engaged in service was the highest percentage observed for any intended group, which in almost all instances for women was general cultural. The close association of sons' and fathers' occupations is also apparent from Table 2.

Intended occupation in terms of Roe's groups was also not independent of father's education. For both sexes, students intending to enter science, general cultural, and arts & entertainment had fathers with significantly more education than fathers of students choosing the other occupations.

Father's occupation and student's intended major. Chi-square tests of the frequencies of sons selecting a major appropriate to prepare for father's occupational group (e.g., engineering major for both the technology and outdoor groups) revealed only two significant values: for business administration with fathers in organization, and for humanities with fathers in general cultural. None of the values for females were significant, not even education major with fathers in general cultural, although education was the preferred major of these women as it was for most other groups.

Table 2

Preferred Occupational Groups of Offspring with Fathers in Different Groups

| Intended occupational group of offspring | Father's occupational group | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Service | Business contact | Organi-zation | Tech-nology | Outdoor | Science | Gen'l Cult-ural | Arts & Ent. |
| Service | | 29F | | | | | | |
| Business contact | | | | | | | | |
| Organization | | | 23M | | | | | |
| Technology | | | | 31M | | | | |
| Outdoor | | | | | 28M | | | |
| Science | | 23M | | | | 48M | | |
| Gen'l Cultural | 38F 21M | (28F) | 30F | 35F | 31F | 38F | 40F 31M | 50F |
| Arts & Ent. | | | | | | | | 25M |
| $N_M$ | 97 | 157 | 184 | 335 | 144 | 27 | 32 | 8 |
| $N_F$ | 95 | 126 | 144 | 270 | 105 | 24 | 35 | 4 |

Note.--Each entry is the highest percentage of students preferring any group from among students with fathers in each occupational group. Students were high school seniors (M = males, F = females). Per cent signs omitted. All groups rated by students.

Father's occupation and student's educational goal. How far students planned to go in school was significantly related to father's groups for both sexes in one-way analyses of variance. Duncan's multiple range test of the differences among these means revealed that males with fathers in general cultural and science were significantly higher in educational goals than males with fathers in outdoor, business contact, and technological occupations. Females with fathers in general cultural and service were similarly more aspiring than females with fathers in outdoor, organization, and technology.

Father's occupation and student aptitude and achievement. One-way analyses of variance within each sex were conducted across groups to see if they accounted for any differences in high school achievement, and aptitude as measured in the senior year. Table 3 indicates that for both 891 males and 844 females, groups did make a significant difference and that having a father engaged in a general cultural occupation was a decided asset. The frequencies of fathers in the various groups were in accord with those shown in Table 1 for high school students. Thus, because of the small numbers of fathers in arts & entertainment, this group was never entered in Table 3 as the group with the lowest mean even though it often had. Offspring of fathers in science were close in quantitative aptitude and achievement to offspring with fathers in general cultural. Among males the disadvantaged consistently had fathers in business contact.

Student's intended occupation, aptitude and achievement. Table 3 also presents the results of analyses of variance conducted across intended groups to see if aptitude and achievement were associated with occupational interests. As Roe reported, excessive numbers chose the professional groups (science and general cultural), 37% of the 834 males, and 52% of the 778 females. For both

Table 3

Analyses of Variance of Aptitude and Achievement as a Function of Father's and Intended Occupational Group

| | Highest and lowest group | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Service | Business Contact | Organ-ization | Tech-nology | Out-doors | Sci-ence | Gen'l Cultural | Arts & Ent | F ratio |
| **Father's occupation** | | | | | | | | | |
| **Males** | | | | | | | | | |
| English GPA | | 2.26 | | | | | 2.74 | | 2.60* |
| Math GPA | | 2.22 | | | | | 2.76 | | 2.05* |
| Verbal Score | | 44.12 | | | | | 51.67 | | 3.55** |
| Quant. Score | | 49.62 | | | | | 54.46 | | 2.65* |
| Mech. Score | | 53.07 | | | | | 59.88 | | 2.21* |
| **Females** | | | | | | | | | |
| English GPA | | | | 2.89 | | | 3.38 | | 3.52** |
| Math GPA | | | | | 2.43 | | 2.93 | | 2.11* |
| Verbal Score | | | | | 49.34 | | 56.72 | | 3.03** |
| Quant. Score | 47.39 | | | | | | 53.72 | | 3.17** |
| Mech. Score | | | | | 43.66 | | 45.54 | | .70 |
| **Intended occupation** | | | | | | | | | |
| **Males** | | | | | | | | | |
| English GPA | | | | | 2.09 | | 2.60 | | 6.30** |
| Math GPA | | | | | | 2.67 | | 1.97 | 9.61** |
| Verbal Score | | | | | 42.78 | | 48.42 | | 5.59** |
| Quant. Score | | | | | 47.34 | 55.71 | | | 12.24** |
| Mech. Score | | 50.76 | | | | 57.32 | | | 8.11** |
| **Females** | | | | | | | | | |
| English GPA | | 2.65 | | | | | 3.10 | | 6.78** |
| Math GPA | | 2.24 | | | | 2.72 | | | 5.77** |
| Verbal Score | | 46.28 | | | | | 53.03 | | 6.03** |
| Quant. Score | | 44.51 | | | | 50.64 | | | 6.98** |
| Mech. Score | | | 42.45 | | | 45.64 | | | 2.90** |

*p<.05, df = 7/≥770
**p<.01, df = 7/≥770

sexes, those intending to enter science had the highest quantitative and mechanical reasoning aptitude and achievement, and those entering general cultural had the highest verbal aptitude and achievement. For males alone, those entering the technological group had a mean mechanical reasoning score of 57.28 essentially identical to the mean for the intended science group. (Because of the small numbers of females intending to enter technology (8) and outdoor (6) groups, these were never entered in Table 3.)

## Summary

Roe was hopeful that her dual classification would serve to explicate relations of personality and family background variables to occupational choice. She felt, however, that research for some time would probably have to involve the intensive, difficult, and painstaking analysis of human lives. It is therefore somewhat ironic that the present research, which offers clear evidence of the validity of her schema, used this schema in a superficial, simple, even machine-scorable manner.

The studies described here demonstrated that Roe's group and level codings provide a measure of SES with extended summarizing capacity. Lavin (1965) stated that the value of SES in predicting academic performance was that it summarized many factors, notably intelligence and the achievement syndrome. To these Roe's occupational classification adds focus of interests. These interests, as manifested in Roe's groups, contributed to multiple prediction in specific academic areas apart from the contribution of level, which is closer to traditional measures of SES. Father's occupation in organization was an asset in the prediction of law school success, but a father in business contact was a handicap in studying architecture. In the differential prediction of freshman grades, Roe's groups and levels held special promise as

applied both to father's occupation and intended occupation of student. Because nonintellective variables contribute particularly to differential prediction of grades (whereas intellective measures contribute more to absolute prediction), Roe's occupational schema can expand the factorial complexity of a predictive battery intended to differentially predict performance in a wide variety of educational curricula. Highly specific curricula such as auto mechanics, agricultural science, studio art, English composition, and nursing practices are obviously the basis for specific occupations. It is therefore expected that group and level codings of background and projected occupations will also be related to <u>actual</u> occupational choice and performance.

The exploratory work with self-ratings demonstrated that in addition to academic prediction, Roe's groups offer a conceptualization of occupations that is psychologically meaningful even to high school seniors. Imagine just how useless the responses of these students would have been if they had been asked instead if their intended occupation was professional, proprietor, clerk, skilled, semiskilled, or unskilled. Imagine what significance Tables 2 and 3 would have if this sort of census bureau categorization had been performed on father's and intended occupations between the sexes. Inasmuch as one of the goals of the new two-way classification was use in vocational guidance, it is noteworthy that the counselees themselves can work within its framework.

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Appendix 1

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# Roe's Classification of Occupations: Instructions for Coding and Examples

ROE CLASSIFICATION OF OCCUPATIONS: INSTRUCTIONS FOR CODING

Occupation is assigned a two digit code. The first digit is the GROUP designation, corresponding to the column of the table of examples, and the second digit is the LEVEL, corresponding to the row of the table. Code the first occupation listed if more than one is given by subject. When an occupation ends with "ing," e.g., "accounting" or "teaching," read it as if it ended as a proper noun, "accountant" or "teacher."

Codes not appearing among the examples are the following:

90 Housewife, homemaker

91 Undecided

92 Unscorable

93 Retired, unspecified (including Retired Armed Forces unspecified)

94 Deceased

95 Armed Forces unspecified

96 Business firm, manufacturing company, etc. unspecified, e.g., "Boeing employee" or "works for Pacific Northwest Bell," or Government, civil service unspecified, e.g., "county employee" or "public work"

97 Unknown

98 None or no entry

Read and keep handy for reference the following chapters from Roe, Anne. The psychology of occupations. New York: Wiley, 1956: Chapters 11, 13-20.

Bureau of Testing Project 1266-125

| | Group I: Service (attending to the personal tastes, needs and welfare of others through guidance, domestic, personal and protective services) | | Group II: Business contact (face to face personal persuasion to sell commodities, services, investments; all sales occupations except routine clerks) |
|---|---|---|---|
| Level 1 | Clinical psychologist<br>Counselor<br>Social work supervisor | | |
| Level 2 | FBI agent<br>Music therapist<br>Occupational therapist<br>Probation officer | Social worker<br>Vocational counselor | Promoter<br>Public relations counselor |
| Level 3 | Armed forces sergeant<br>Case worker<br>Detective<br>Employment interviewer<br>Inspector, city, state, customs<br>Investigator for immigration service, IRS<br>Police sergeant, toll bridge sergeant<br>Railroad conductor<br>Sheriff<br>Welfare worker<br>YMCA/YWCA official | | Auto dealer<br>Broker of real estate, commodities, insurance<br>Business organizer & speculator<br>Dealer, retail & wholesale<br>Insurance business<br>Manufacturer's representative, factory rep, sales rep<br>Merchant, merchandising<br>Realtor<br>Salesman, all kinds, auto, insurance, marine supplies, bread, milk, real estate, technical (not sales clerk or saleswoman)<br>Sales manager, financing, director, engineer, etc. |
| Level 4 | Barber<br>Bartender, manager tavern<br>Chef<br>Hairdresser<br>Headwaiter or steward | Policeman<br>Practical nurse (nurse without college)<br>Religious worker (not clergy) | Auctioneer<br>Buyer<br>Driver salesman<br>House canvasser or interviewer incl phone<br>Salesman, house-to-house; Fuller Brush, Avon |
| Level 5 | Armed forces private, corporal<br>Bellhop<br>Chauffer<br>Cook<br>Custodian or janitor<br>Driver of taxi, bus (not truck)<br>Fireman, city (not RR) | Hospital orderly, attdnt<br>Household servant<br>Lunch room assistant<br>Maintenance<br>Prison guard<br>Train porter<br>Usher<br>Waiter,waitress,barmaid | Peddler |
| Level 6 | Elevator operator<br>Garbage collector<br>Guard,watchman<br>Maid | | |

Group III: Organization (managerial, ownership, or white collar job in business, industry, or government)

| | | |
|---|---|---|
| Level 1 | High government officials, state and federal (attorney general, lieutenant governor, secretary of agriculture, director of branch of state government)<br>International banker | |
| Level 2 | Army or air force officer<br>Banker<br>Broker, stockbroker<br>Career in international relations<br>Commissioner federal<br>Comptroller<br>Corporate officer (company treasurer, secretary) | Executive<br>Management analyst<br>Politician<br>President of XXX Company<br>Public official (consul, mayor, county auditor)<br>Union official |
| Level 3 | Accountant, C.P.A., L.P.A.<br>Administrative assistant<br>Appraiser<br>Auditor<br>Bank teller<br>Businessman<br>Business manager<br>Contact representative<br>Credit manager<br>Employment manager<br>Estimator<br>Federal credit union administrator<br>Fuel dealer<br>Funeral director<br>Government supervisor | Hotel manager<br>Insurance adjustor, labor investigator<br>Manager, regional, personnel<br>Manufacturer, small owner, proprietor (bar, drycleaning, dairy, restaurant, grocery, service station, small mfg or dist. concern)<br>Office agent, manager<br>Postmaster, post official<br>Right of way agent<br>Service representative<br>Statistician<br>Supervisor, clerical, office<br>Supplies supervisor<br>Traffic manager<br>Wholesale distributor |
| Level 4 | Apartment and motel operator, landlord<br>Bookkeeper<br>Business machine operator<br>Cashier<br>Clerk<br>Compiler | Comptometer operator<br>Dispatcher<br>Floorwalker, receptionist<br>Foreman of warehouse<br>Freight agent or RR representative<br>Postal clerk, guard, carrier | Property manager<br>Salesclerk, saleswoman (salesman only if dept. store)<br>Secretary, medical<br>Stenographer<br>Telephone, PBX operator |
| Level 5 | Checker<br>Clerk typist<br>File clerk<br>Keypunch operator | Multigraph operator<br>Notary<br>Shipping clerk<br>Stock clerk | Ticket clerk<br>Typist |
| Level 6 | Messenger, runner | | |

Group IV: Technology (concerned with production, maintenance, and transportation of commodities and utilities)

| | | | |
|---|---|---|---|
| Level 1 | Applied research scientist, consulting<br>Commander of ship<br>Consulting engineer<br>Designer, auto, tools | | |
| Level 2 | Applied scientist in geology, oceanography, meteorology<br>Engineer; chemical, civil, mech, tool, nuclear, supervising, chief<br>Factory manager or operator | | Officer Coast Guard, Navy, Marine<br>Research |
| Level 3 | Aviator or airplane pilot<br>Boeing supervisor<br>Builder<br>Chief petty officer, yeoman<br>Contractor, construction, carpentry, plumbing<br>Draftsman<br>Engineer with no degree, marine | | Foreman or leadman, factory, wood<br>Planner, electrical, tool<br>Production supervisor<br>Radio operator<br>Superintendent of construction |
| Level 4 | Bookbinder<br>Brakeman<br>Bricklayer<br>Cabinetmaker<br>Carman<br>Carpenter<br>Computer programmer<br>Electrician<br>Electronics technician<br>Engineering aide<br>Equipment serviceman<br>Exterminator | Inspector factory or company<br>Installer, telephones, appliances<br>Jeweler<br>Linotyper<br>Locomotive engineer<br>Machinist<br>Mechanic<br>Millwright<br>Motorman<br>Operating engineer<br>Painter<br>Paperhanger | Patternmaker or molder<br>Plumber<br>Printer<br>Repairman<br>Shipfitter<br>Ship's rigger<br>Steel worker<br>Tailor<br>Telegraph operator<br>Telephone switchman<br>Upholsterer<br>Welder |
| Level 5 | Assembly worker<br>Baker<br>Boilermaker<br>Bulldozer, crane operator<br>Butcher<br>Concrete worker, cement finisher<br>Construction machinery operator | Deliveryman<br>Driver<br>Factory worker<br>Finisher<br>Fireman railroad<br>Laundry, drycleaning worker<br>Lineman<br>Tire recapper | Lumber grader<br>Mill worker<br>Roofer<br>Sheetmetal worker<br>Switchman railroad<br>Shoe repair<br>Seaman<br>Truck driver, teamster<br>Waterworks tender |
| Level 6 | Construction<br>Foundryman<br>Helper, carpenter, plumber<br>Laborer, construction, process, etc | Longshoreman<br>Night loader<br>Packer<br>Section hand | Service station attendant<br>Warehousing<br>Wrapper<br>Yardman |

# ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

| Group V: Outdoor (agricultural, fishery, forestry, mining, and kindred occupations) | | Group VI: Science (Scientific theory and its application under specified circumstances other than technology) |
|---|---|---|
| Level 1 Consulting specialist | | Museum (science) curator<br>Physician<br>Professor, science<br>Research scientist (economist, political scientist, sociologist etc. in addition to physical scientists included)<br>University faculty member, science |
| Level 2 Agronomist<br>Horticulturist<br>Landowner or operator, large<br>Landscape architect<br>Range management specialist<br>Wildlife specialist | | Dental inspector<br>Dentist<br>Nurse, nurse administrator<br>Optician<br>Pharmacist<br>Physical therapist<br>Veterinarian<br>Veterinary meat inspector<br>Sanitarian<br>Scientist (chemist, physicist, mathematician, sociologist, etc. not applied) |
| Level 3 Apiarist (beekeeper)<br>Christmas tree business<br>County agent<br>Farmer<br>Fish, game warden<br>Forester<br>Forest ranger, park superintendant<br>Nurseryman (owner)<br>Rancher<br>Reforestation | Surveyor<br>Tree surgeon<br>Truckgardener | Analyst for General Electric<br>Chiropodist<br>Chiropractor<br>Laboratory technician or supervisor<br>Medical technician<br>Weather observer<br>X-ray technician |
| Level 4 Fisherman, owner; charter boat operator<br>Laboratory tester (dairy products, etc.)<br>Landscape gardener<br>Miner<br>Oil well driller<br>Ore grader<br>Soil conservation aide | | Embalmer<br>Technical assistant |
| Level 5 Farm tenant<br>Gardener<br>Hostel keeper<br>Lumber inspector | Nursery employee<br>Teamster<br>Trapper<br>Tractor driver | Veterinary hospital attendant |
| Level 6 Dairy hand<br>Farm laborer<br>Fieldman<br>Fisherman | Logger<br>Lumberjack<br>Boomman<br>Burner | Nontechnical helper in scientific organization |

Bureau of Testing Project 1266-125

ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

| Group VII: General cultural (preservation and transmission of general cultural heritage) | | Group VIII: Arts and entertainment (use of special skills in creative arts, entertainment, or sports) | |
|---|---|---|---|
| Level 1 | Educational administrator (superintendant, president)<br>Federal judge<br>University and college faculty unspecified and humanities (English, history, languages, philosophy)<br>State supreme court judge | Actor<br>Artist<br>Athletic champion<br>Choreographer<br>Composer<br>Concert artist | Dancer<br>Museum (fine arts) curator<br>Musician, symphony<br>Sculptor<br>Singer<br>Motion picture writer<br>Writer |
| Level 2 | Clergy<br>Columnist, commentator<br>Editor<br>Interpreter<br>Journalist<br>Lawyer, attorney<br>School administrator (principal, ass't supt)<br>School teacher (high school and elementary)<br>State superior court judge | Athlete, professional<br>Athletic coach<br>Architect<br>Art critic<br>Circus performer<br>City planner<br>Music arranger or director<br>Music critic<br>Teacher of art or music, elementary level included | |
| Level 3 | Justice of the Peace<br>Law clerk<br>Librarian<br>Municipal judge<br>Radio announcer<br>Reporter | Advertising writer<br>Commercial artist<br>Designer, clothes, textiles, stage, jewelry, etc.<br>Interior decorator<br>Musician, popular, band<br>Stage designer | |
| Level 4 | Indexer<br>Library assistant | Advertising artist<br>Decorator<br>Illustrator<br>Monument maker<br>Photographer | Racing car driver<br>Window draper |
| Level 5 | | Illustrator, greeting cards<br>Photographic technician<br>Show card letterer<br>Stagehand | |